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EUROPEAN PATENT APPLICATION

21 Application number: 89300993.6

51 Int. Cl.⁴: **F 16 H 1/445**

22 Date of filing: 01.02.89

30 Priority: 10.02.88 US 154395

43 Date of publication of application:
16.08.89 Bulletin 89/33

84 Designated Contracting States: DE FR GB IT

88 Date of deferred publication of search report:
07.02.90 Bulletin 90/06

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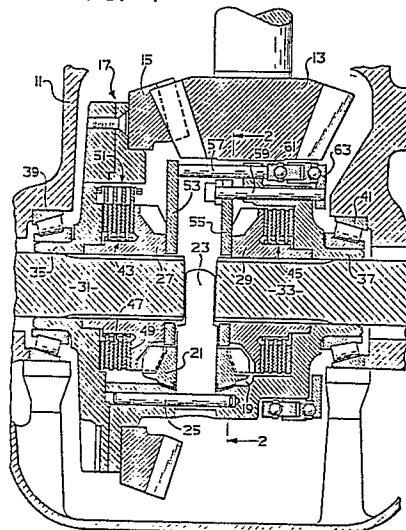
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54 **Differential smart clutch with gear reaction.**

57 A differential gear mechanism is provided of the type including a gear case (17), at least one pinion gear (21), and a pair of side gears (27 and 29). Clutch packs (43 and 45) are disposed between the side gears and the gear case and are operable, when engaged, to retard relative rotation between the gear case and the side gears. Surrounding the gear case is a fluid pressure mechanism (71) including a cylinder (73) and a piston (75), both of which are rotationally stationary, but free to move axially. Adjacent the piston-cylinder assembly is a pair of reaction members (61 and 63) which transmit the axial displacements of the piston and cylinder, by means of members (57 and 59), to a pair of load plates (53 and 55), such that the displacements exert axially-outward biasing forces on the side gears and on the clutch packs. Because the piston-cylinder assembly is external to the gear case, no rotating seals are required. In addition, because the hydraulic biasing forces act in the same direction as normal gear reaction forces, less hydraulic force is required to actuate the clutch packs.

FIG. 1





EP 89 30 0993

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	EP-A-0 189 556 (TOYOTA JIDOSHA K.K.) * Page 2, lines 9-23; figures 1,2 *	1-3	F 16 H 1/445
Y	---	4-7,11-14	
Y	DE-A-3 345 927 (BAYERISCHE MOTOREN WERKE AG) * Page 7, lines 15-24; page 7, line 32 - page 8, line 6; page 9, lines 5-12; figure *	4-7,11-14	
A	---	9,16	
A	GB-A-2 138 083 (DAIMLER-BENZ AG) * Figure 1; ref. 31,32,61 *	1,11	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			F 16 H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21-11-1989	Examiner BEERNAERT J.E.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	